## TITLE OF THE INVENTION

APPARATUS FOR BODY MOTION STEERING CONTROL FOR WATER CRAFT

## CROSS-REFERENCE TO RELATED APPLICATIONS

This non-provisional patent application claims the benefit of United States Provisional Patent Application 60/438,080 filed on January 6, 2003.

## BACKGROUND OF THE INVENTION

### Field of the Invention

This invention relates to water craft. This invention further relates to an apparatus for body motion steering control for water craft.

## Background of the Invention

Water craft with outboard motors are commonly used for recreational fishing in rivers and lakes. The outboard motors are electric or gasoline driven. One type of fishing, called trolling, requires the operation of the outboard motor while fishing. When trolling, the operator is compelled to steer the craft while fishing. Understandably, the operator, holding the fishing rod, will find it difficult to steer the craft and fish at the same time. Prior to my invention, trolling usually required setting the motor in a first desired direction along a first desired track. When the operator desires to change to a second direction and track, it is necessary to suspend fishing operations and direct full attention to the outboard motor. Clearly, this disruption of fishing operations leads to a lessened enjoyment of the sport.

Therefore, it is desirable to have an apparatus that can be used for trolling that does not require the disruption of fishing operations to steer the craft.

## OBJECTIVES OF THE INVENTION

It is an object of the present invention to provide an apparatus for body motion steering control for water craft.

It is a further objective of the present invention to provide an apparatus for steering water craft that does not require the operator to suspend fishing operations in order to change the direction of the water craft.

## SUMMARY OF THE INVENTION

In order to overcome the deficiencies noted above and to meet the objectives stated herein, my invention provides for an apparatus for body motion steering control for water craft.

My invention is an apparatus for body motion steering control adapted for installation in a small water craft powered by an outboard motor such as an electric trolling motor or a small gasoline driven motor.

My invention comprises a seat mounted to a first and second swivel permitting rotation of the seat about a first vertical axis. The seat and first and second swivels are mounted to a stationery base platform which is typically a flat hull cross-member. The seat is adapted to receive body motion commands from an operator sitting in it.

The seat comprises a generally horizontal seating platform, two side members and a back rest. The seat is contoured for comfort and to allow the operator to better transmit body motion to the seat.

A first control member holds a pin that can engage a second control member. The first control member is mounted to the seat and first swivel. The second control member is mounted between and to the first and second swivel. When the pin is engaged, first swivel is stopped and only the second swivel is free to rotate. The first control member that is fixed to the seat can be, in turn, fixed at a predetermined angle with respect to the second control member to permit the operator to

fish over the port or starboard side of the water craft while remaining generally oriented toward the front of the water craft.

There is a rod between the second control member and the outboard motor. When the pin is engaged, the rod transfers body motion commands from the seat to the outboard motor through the second control member.

Further objects and advantages will become apparent from a consideration of the ensuing description and drawings.

**DESCRIPTION OF THE DRAWINGS**

Figure 1 comprises various views of a water craft using a preferred embodiment of my invention.

Figure 2 comprises various views of the seat body of one embodiment of my invention.

Figure 3 is a schematic elevation view the first and second swivel bodies of one embodiment of my invention.

Figure 4 is view the pin member of one embodiment of my invention in a first engaged and second disengaged position with respect to the second control member.

Figure 5 is a view of the pin member of one embodiment of my invention.

Figure 6 comprises various views of the first control member of a preferred embodiment of my invention.

Figure 7 comprises various views of the second control member of a preferred embodiment of my invention.

Figure 8 is top view of the position of the first control member with respect to the second control member in one embodiment of my invention.

Figure 9 comprises various views of the rod of one embodiment of my invention connecting the second control member to the outboard motor.

Figure 10 comprises various views of the clevis of one embodiment of my invention.

Figure 11 shows a view of the positional relationship between the first control member, the second control member and the pin in one embodiment of my invention.

Figure 12 is a detailed view of one clevis of my invention attached to the second control member.

Figure 13 is a view of the connection between another clevis of my invention and the outboard motor.

Figure 14 comprises various views of the bracket used in one embodiment of my invention.

Figure 15 is a schematic view of the operation of one embodiment of my invention.

Figure 16 is another schematic view of the operation of one embodiment of my invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figure 1, my invention (10) is an apparatus for body motion steering control. My invention (10) is adapted for installation in a small water craft (12) having a hull (14), a bow (16), a stern (18), a port side (20) and a starboard side (22). The stern includes a transom member (24) adapted to mount an outboard motor (26). The outboard motor can be an electric trolling motor or a small gasoline driven motor. The motor has a vertical shaft casing (28) in which the drive shaft of the motor is contained. The drive shaft is connected by a transmission (30) to a propeller (32). The small craft includes at least one flat hull cross-member (34) acting as a seat. The at least one flat hull cross-member (34) has an upper surface (38), a first length (40) and a first width (42).

Referring now to Figures 1 and 2, my invention (10) comprises a seat body (44) having swivel means (46) permitting rotation of the seat body (44) about a first vertical axis (48). The seat body (44) is mounted by mounting means to a stationery base platform which is typically the flat hull cross-member (34). Mounting means typically comprise a nut, bolt and washer combination although the invention may be permanently fixed by welding to the hull cross-member (34). In another embodiment of the invention, the swivel body stationery base platform may be a separate rectangular member having a width and length similar the width and length of the hull cross-member which can be temporarily and releasably fixed to the hull cross-member (34) by temporary mounting means such as clamps. The seat body (44) is adapted to receive body motion

commands as more fully explained below. My invention (10) also includes means, generally shown as (50), for transmitting body motion commands from the seat body (44) to the outboard motor (26). There is also included in my invention (10) means, generally shown as (52) for controlling the swiveling motion of the seat body (44). There is also included in my invention means, generally shown as (54) for translating the body motion commands into outboard motor (26) steering commands.

Still referring to Figures 1 and 2, there is provided a more detailed description of the seat body (44) of my invention (10). The seat body (44) comprises a generally horizontal seating platform (56). The seating platform may be contoured to more comfortably accept the buttocks of an operator. Alternatively, there may be a cushion fixed to the horizontal seating platform (56) for operator comfort. The seating platform (56) has a leading edge (60) having a sinusoidal contour (62) that is adapted to comfortable accept the back thighs of an operator and, as well, to facilitate the swivel motion of the seat body by providing an abutting surface (at 60) between the legs of the operator for port and starboard swivel motions of the seat body.

In order to translate body motion of the operator into swivel motion of the seat body (44), the seat body includes a first upward curving port side member (64) fixed to the port side (65) of the horizontal seating platform (56). The first curving port side member (64) has an inwards concave surface to better fit against the substantially convex contour of the left thigh of an operator. The first curving port side member (64) has a first top surface (68) to act as an arm rest and a first skirt (70) depending down from the first arm rest (68). The first skirt (70) and first top surface (68) create a first hollow (70) that may be used for grasping by the operator. Similarly, on the starboard side (22) of the seat body (44) there is a second upward curving starboard side member

(72) fixed to the starboard side (74) of the horizontal seating platform (56). The second curving starboard side member (72) has an inwards concave surface to better fit against the substantially convex contour of the right thigh of an operator. The second curving starboard side member (72) has a second top surface (74) adapted to act as an arm rest and a second skirt (76) depending from the second top surface (74). The second top surface (74) and the second skirt (76) act together to form second hollow (78) that may be used for grasping by an operator. The seat body (44) further includes a third upward curving back member (80) disposed between the port upwardly curving side member (64) and the starboard upward curving side member (72). The upward curving back member (80) is adapted to conform to the lower back and buttocks of an operator. The horizontal platform (56), port side member (64), starboard side member (72) and back member (80) are moulded from a suitable thermoplastic material from a single mould and form a single piece. Also included as part of the seating body (44) is back rest (82). Back rest (82) is moulded as a single piece from suitable thermoplastic materials and possesses a contour adapted to follow the contour of an operator's back for comfort and to facilitate transmission of body motions to the seat body (44). The bottom of back rest (82) includes a port projection (84) having an aperture (86) that is adapted to receive a pin in order to pin the port projection (84) to apertured lug (86) on the upper port surface (68). The starboard side is obviously similarly configured but not illustrated in this Figure 2. This permits the backrest (82) to pivot to and fro around a second horizontal axis (88).

Referring now to Figure 3, there is shown greater detail of the swivel means of my invention (10) shown generally at (46) that permits the motion of the seat body (44) around first vertical axis (48). Swivel means (46) is mounted by mounting means between the bottom surface (81) of the seat body (44) and the stationery base platform (34). Swivel means comprises a first swivel body (90) co-axial with the first vertical axis (48) and a second swivel body (92) also co-axial with the

first vertical axis (46). The first swivel body (90) comprises a first rectangular lower mounting plate (94) mounted by mounting means (96) to the stationery base platform (34). The first swivel body (90) also includes a first rectangular upper mounting plate (98) a first circular bearing track (100) including a plurality of bearings (102) disposed in the first bearing track. The bearings permit the first rectangular upper mounting plate (98) to rotate with respect to the first rectangular lower mounting plate (94) fixed to the stationery base platform (34).

The second swivel body (92) comprises a second rectangular lower mounting plate (104) mounted by mounting means (96) in a spaced relationship above the first rectangular upper mounting plate (98) of the first swivel body (90). Between mounting plate (104) and mounting plate (98) are shims (106) having a height equal to the height of the second control member (200).

There is also a second rectangular upper mounting plate (108) mounted by mounting means (96) in a spaced relationship to the bottom surface (81) of the seat body (44). There are shims (107) mounted between plate (108) and surface (81). The shims have the same height as the first control member (150).

The second swivel body (92) also includes a second circular bearing track (110) including a plurality of bearings (112) disposed in the second bearing track. The plurality of bearings permit the second rectangular lower mounting plate (104) to rotate with respect to the second rectangular upper mounting plate (98).

The four rectangular mounting plates (94), (98), (104) and (108) each have four corners that are apertured to accommodate mounting means (96).

Still referring to Figure 3, there is shown detail of the control means, shown generally as (52) for controlling the swivel of the seat body (44). There is a first control member (150) mounted between the bottom surface (81) of the seat body (44) and the first rectangular upper mounting plate (108). As more fully explained below, the first control member (150) controls movement of the seat body (44) with respect to the second control member (200). Second control member (200) is mounted between mounting plate (104) and mounting plate (98). There is a third control member (300) fixed to the first control member (150) and adapted for engagement with the second control member (200) so as to prevent relative motion between the first and second control members.

Referring now to Figures 3, 4 and 5 there is shown one embodiment of my invention wherein the third control member (300) comprises a pin member that is mounted in a sliding relationship within a sleeve (302) fixed to the end of first control member (150). Biasing means (304) is included within the sleeve (302) to provide biasing to the pin member (300). Alternatively, the biasing means (303) can be located outside of the sleeve (302) as illustrated in Figure 10.

Referring to Figures 4 and 5, there is shown the pin member (300) in a first disengaged position (Figure 4A) and a second engaged position (Figure 4B). The pin member (300) includes a vertical shaft portion (304) having an engagement end (306). Pin member (300) also includes handle portion (308). The vertical shaft portion includes two opposing horizontal projections (309) and (310). The projections are adapted for sliding engagement within slot (314). When the pin member (300) is fully engaged into the second control plate (200) as shown in Figure 4B, the horizontal projections (309) and (310) are located at the bottom of the slot (314). The biasing

member (304) expands to keep the engagement end (306) within the control member (200). When the pin member is disengaged from control member (200) the projections (309) and (310) are outside of the slot (314) and sit on the top surface (316) of guide member (302). The guide member (302) is a tubular structure that is welded into place within control member (150).

Referring now to Figure 6, there is shown various views of the first control member (150). The first control member (150) comprises a first flat plate having a longitudinal axis (152). The first flat plate (150) has a paddle shape including four contiguous and congruent portions comprising a shaft portion (154), a throat portion (156), a blade portion (158) and tip portion (160). The shaft portion (154) has a first end (162) having a first width (164), a first side (166) and a second side (168). The first side (166) and said second side (168) are parallel and the first end (162) is disposed perpendicular between the first side (166) and the second side (168). The throat portion (156) has a third side (170) and a fourth side (172). The third and fourth sides have a concave shape to them with a radius of about 2.2 inches. The blade portion (158) has a fifth side (174) and a sixth side (176). The convex portions of the fifth and sixth sides have a radius of about 2.5 inches. The tip portion (160) is linear and disposed between the fifth side and the sixth side, perpendicular to the longitudinal axis (152) and parallel to said first end (162). The tip portion (160) is about 6.75 inches wide and the opposite first end (162) is about 1.87 inches wide. The first control member has a length of about 8.5 inches. The first control member is manufactured from aluminum or stainless steel having a suitable gauge or other suitable material.

Still referring to Figure 6, the first control member (150) has an aperture (178) located adjacent to the first end (162) and upon the longitudinal axis (152). The aperture (178) is about 0.50 inches in diameter and adapted to receive the guide sleeve (302) as previously noted. The guide sleeve

(302) is slotted at (304) to receive projections (309) and (310) on the pin member (300). The guide sleeve extends about 1.38 inches above the first control member (150) and about 0.50 inches below the control member (150). The blade portion (158) includes a first elongate aperture (180) having a first aperture longitudinal axis (182). The first aperture longitudinal axis (182) has a first acclivity (184) of about negative 45 degrees from the first control member longitudinal axis (152). The first elongate aperture (180) is located close to the fifth side (174) of the blade portion (158). There is a second elongate aperture (186) having a second aperture longitudinal axis (188) having a second acclivity (190) of about positive 45 degrees from the first control member longitudinal axis (152). The second elongate aperture (186) is located close to the sixth side (176) of the blade portion (158). While the first control member described herein constitutes the preferred embodiment of this member, it can take other shapes. The first and second elongate apertures are adapted to permit axial alignment of the first and second control members along their respective longitudinal axis.

Referring back to Figure 3, the first control member (150) is mounted underneath the seat body (44) adjacent to bottom surface (81). Elongate apertures (180) and (186) are mounted to the bottom surface (81) of seat body (44) as shown so that the first end (162) projects beyond the seat body (44) permitting the operator to access the pin member (300). The first rectangular upper mounting surface (108) of the first swivel body (92) is mounted below the first control member (150) as illustrated in Figure 3. Shims (107) having a thickness equal to the thickness of the first control member are inserted opposite the tip (160) of the first control member (150) so that the control member is maintained parallel to the surface (81). The elongate apertures (180) and (186) are adapted to permit axial adjustment of the first control member (150) with respect to the second control member (200) during installation.

Referring now to Figure 7, there is shown a variety of views of the second control member (200). The second control member (200) comprises a second flat plate having a second flat plate longitudinal axis (202), a top surface (204) and a bottom surface (206). The second control member has a substantially keystone shape including a flat bottom side (208), a lower left corner (210), a lower right corner (212), an arcuate top side (214), a top left corner (216), a top right corner (218), a left side (220) inclined away from the second flat plate horizontal axis (202) and a right side (222) inclined away from the second flat plate horizontal axis (202). The second control member (200) further includes a first elongate aperture (224) located proximate to the lower left corner (210). There is also a second elongate aperture (226) located proximate to said lower right corner (212). There is a third aperture (228) located proximate to said left side. The third aperture has a raised collar (230). A fourth aperture (232) is located adjacent to the third aperture (228) and proximate to the left side (220). The fourth aperture has a raised collar (234). There is also a fifth elongate aperture (240) located proximate to the top left corner (216) and a sixth elongate aperture (242) located proximate to said top right corner (218). A seventh aperture (244) is located at the top end of the longitudinal axis (202) and has a raised collar (246). The second control member (200) is manufactured from aluminum or stainless steel having a suitable gauge or other suitable material. The width of bottom side (208) is about 7 inches and the width across the top side (214) is about 9.2 inches. The second control member (200) has a length of about 8 inches. Each of the two bottom elongate apertures (224) and (226) are inclined at an angle of about 45 degrees away from the longitudinal axis (202).

Still referring to Figure 7, the second control plate (200) further includes a first rectangular projection (250) projecting from the top left corner (216) of the control plate (200, a second

rectangular projection (252) projecting from the middle of the arcuate top surface (214) along the control plate longitudinal axis (202) and a third rectangular projection (254) projecting from the top right corner (218) of the control plate (200). The first, second and third rectangular projections are adapted as sighting guides so that an operator can visually guide the third control member (300) into engagement with the second control member (200).

Referring back to Figure 3, the second control member (200) is mounted by mounting means through apertures (224) and (226) between the bottom rectangular member (104) of the first swivel body (92) and the top rectangular member (98) of the second swivel body (90). The top curved end (214) of the second control member (200) projects out from under the seat body (44) so that the engagement end (306) of pin member (300) is able to engage the pin engagement apertures of the second control member (200). The pin engagement apertures on the second control member comprise apertures (244), (240) and (242).

Referring now to Figure 8, there is shown the operating relationship between the first control member (150), the second control member (200) and the pin member (300). The view in Figure 8 is with the seat body (44) removed and looking down onto the top rectangular mounting member (98) of the first swivel body (90). Note that the elongate apertures (180) and (186) in the first control member (150) and the elongate apertures (224) and (226) (not shown) permit axial adjustment of the first control member (150) with respect to the second control member (200) so that the longitudinal axis (152) of the first control member (150) is aligned with the longitudinal axis (202) of the second control member (200) during initial installation. The initial orientation of control member (150) and control member (200) is shown in Figure 8 with respect to the bow (16) and stern (18) of the craft. The two control members project to port (20). In the configuration

shown in Figure 8, the seat body is oriented so that the operator sitting in the seat body is facing towards the bow (16). The pin member (300) is engaged in a first engagement location with aperture (244) on the second control member (200) thereby fixing the seat body (44) in a bow facing orientation. Referring back to Figure 3, with pin member (300) engaged within aperture (244) swivel body (92) cannot swivel and swivel body (90) can swivel so that seat body (44) can swivel with respect to the cross-member (34). Referring again to Figure 8, the operator may wish to fix the seat body in an orientation that permits the operator to face towards the starboard side (22) of the craft. To do this, the pin member (300) is lifted and disengaged from aperture (244) and the seat is swiveled (per arrow (400) to a position that is about 30 degrees to starboard. The pin member is engaged in a second engagement location into aperture (240). Similarly, if the operator wishes to swivel the seat body 30 degrees to port (per arrow (402)), the pin member (300) can be engaged in a third engagement location into aperture (242).

Referring back to Figure 1 and also to Figure 9, I will now describe the means (50) for transmitting body motion commands from the seat body (44) to an outboard motor (26). There is a control rod (51) having a first threaded end (450) and a second threaded end (452). There is also means (454) for connecting the control rod (51) first threaded end (450) to the second control plate (200) and means (456) for connecting the control rod (51) second threaded (452) end to the outboard motor (26).

Referring now to Figure 10, there is shown means (454) for connecting the control rod first end (450) to the second control plate (200). Means (454) includes clevis (460) comprising a base (462) having a threaded aperture (464) adapted to receive the control rod first threaded end (450). There is also a first tine (466) fixed to the base (462). The first tine has a first arcuate free end

(468) and a first tine first aperture (470). There is also a second tine (472) fixed to the base (462) opposite to and parallel to the first tine (466). The second tine has a second arcuate free end (474) and a second tine second aperture (476).

Referring to Figure 10, Figure 11, Figure 12 and Figure 7, the clevis (460) is adapted to receive the left side of the control plate (200) between the first and second tines. The first tine first aperture (470) and the second tine second aperture (476) are co-axially aligned with the control plate third aperture (228) or alternatively control plate fourth aperture (232). A pin member (480) adapted for quick releasable placement within the co-axially aligned first tine first aperture, second tine second aperture and control plate third aperture is inserted thereby fixing the control rod (51) first end (450) to the second control plate.

Referring to Figure 13, I will now describe means (54) for connecting the control rod (51) second end (452) to the outboard motor (26). There is a second clevis (490) identical to the first clevis (460) comprising a second base (492) having a second threaded aperture (494) adapted to receive the control rod second threaded end (452). There is a third tine (496) fixed to the second base with an arcuate free end and an aperture. There is a fourth tine (498) fixed to the second base opposite to and parallel to the third tine. The fourth tine has a fourth arcuate free end with a fourth tine fourth aperture.

Since both ends of the control rod (51) are threaded into the first and second clevis (460) and (490) respectively the tension in the rod can be adjusted by threading more or less of the threaded ends of the rod into the first and second clevis. As well, the rod has a contoured shape to permit

transmission of movements from the seat body (44) to the outboard motor (26) in an off-set manner.

Referring to Figure 13 and Figure 14, there is shown a bracket arm (500) having a longitudinal axis (502), a first half (504) and a second half (506). The first half has at least two apertures (508) and (510) positioned vertically. The second half has at least two apertures (512) and (514) positioned vertically. There is also one threaded longitudinal bore (516) adapted to receive threaded rod (520). Friction clamp (522) is adapted to clamp around the vertical shaft casing (524) of the outboard motor (26). The friction clamp (522) has a collar portion (526) adapted to frictionally engage the vertical shaft casing and two adjacent and parallel arms (528) and (530 not shown) apertured to receive threaded rod (520). There is a nut (532) adapted for threaded engagement onto the threaded rod so that the two adjacent and parallel arms are between the nut and the bracket second end. When the nut is rotated towards the bracket second end the two adjacent and parallel arms are compressed together thereby tightening the collar about the vertical shaft casing. A quick release pin (540) is provided for pinning the bracket first end between the third tine and the fourth tine in a pivoting engagement.

Referring back to Figure 3 and Figure 10, when the swivel motion of the seat body (44) is fixed with respect to the swivel motion of the control plate (200), arm (600) is used to control the direction of the seat body and as well the movement of the outboard motor. Arm (600) comprises shaft (602) having a first end (604) and a second end (606). Attached to the second end (606) is hand control knob (608) used by the operator to push the shaft bow ward or stern ward. The first end (604) is placed into shaft receiver (610) welded to the bottom surface of control member (200).

Referring now to Figure 15, there is shown a schematic diagram of the operation of my invention with the pin member (300) disengaged from control member (200). When the pin member (300) is disengaged from control member (200) first swivel body (90) and second swivel body (92) are free to swivel with respect to each other. Therefore, seat body (44) is free to swivel in any direction and cannot be used to direct the boat. The body motion steering control apparatus is disengaged. The arm (600) can be used to direct the craft in a desired direction or alternatively, the operator can swivel the seat body towards the stern and control the direction of the boat using the arm (25) of the outboard motor (26). In Figure 14A, if the operator wishes the boat to go to starboard the arm (600) is moved towards the bow (16) of the boat. This motion is transmitted by control rod (51) in a pulling motion as indicated by arrows (700) side and the outboard motor (26) is turned so that the propeller (710) swings to starboard pushing the bow of the boat to starboard. In Figure 14B, if the operator wishes the boat to go to port, the arm (600) is moved towards the stern (18). The motion is transmitted by control rod (51) as a pushing motion as indicated by arrows (714) and the propeller is forced to port. The bow is then driven to port.

Referring now to Figure 16, the control pin (300) is engaged with control member (200). When the control pin is engaged the body motion steering control apparatus is engaged. First swivel body (90) and second swivel body (92) are not permitted independent movement. Therefore, only the seat body (44) may swivel with respect to mounting member (94). The seat body (44) can be used by the operator to impart motion to the propeller in order to direct the boat. In Figure 15A, if the operator swivels to starboard the swivel motion is transmitted by control rod (51) to the motor as a pulling motion as indicated by arrows (730). This pulling motion causes the propeller (710) on the motor (26) to turn to starboard as shown by arrow (732) pushing the bow of the boat to

starboard. If the operator wishes the boat to move to port, the operator swivels the seat body to port this causes a pushing motion in control rod (51) as indicated by arrows (734) causing propeller (710) to move to port as indicated by arrow (736). This pushes the bow to port.

By using the seat body, the operator is able to troll at low speeds while fishing and use body motion to swivel the seat to port or starboard in order to direct the boat. This is a preferred hands free operation allowing the operator to concentrate on the sport. As previously noted, the operator can lock the seat body 30 degrees to port or starboard permitting the operator to face the desired side of the boat while using body motion to steer the boat.

Other embodiments of my invention are contemplated. For example, the arm (600) and shaft receiver (610) shown on Figure 10 may be a single piece of solid, half inch round aluminum rod, welded to the control member (200).

In another embodiment of the invention, the first control member (150) can have the same dimensions as the second control member.

In still another embodiment of my invention, an optional bracket can be attached to the seat body (44) having control means to control the operation of the motor, such as start-stop and throttle.

Although this description has much specificity, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention. Thus the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.